Electrically and Optically Symmetrical Analog-to-Digital Converter for Digital Pixel Sensors

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ABSTRACT OF THE DISCLOSURE

A circuit includes an analog-to-digital (A/D) converter for multiplexing between a number of analog input signals and converting the selected analog input signals to a digital code representation. The A/D converter includes a comparator having a first input terminal coupled to receive a first reference signal having a number of levels, a second input terminal coupled to receive a multiple number of analog input signals, and a third input terminal for receiving a multiple number of input select signals. The comparator includes a multiplexor coupling the multiple number of analog input signals to a multiple number of corresponding differential pairs. The multiplexor selects one of the multiple number of differential pairs based on the multiple number of input select signals. In one embodiment, the A/D converter is applied in a digital image sensor for performing pixel-level analog-to-digital conversion using a multi-channel bit serial ADC technique.